Materials Handling, Storage, Use, and Disposal

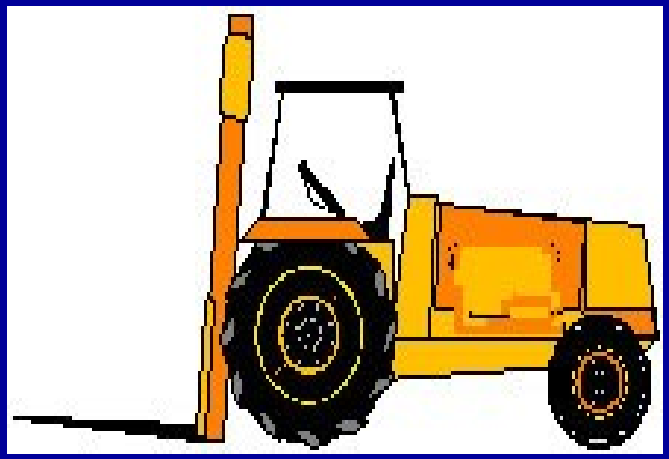
Overview -- Handling and Storing Materials

Involves diverse operations:

Manual material handling
- **Carrying bags or materials**
- **Unpacking materials**

Material handling via machine
- **Forklift**
- **Crane**
- **Rigging**

Stacking or storing drums, barrels, kegs, lumber, loose bricks or other materials



Injuries

Lifting objects is a major cause of back injuries in the work place

Improper storing and handling of material and equipment can cause struck by and crushed by injuries

Hazards

Improper manual lifting or carrying loads that are too large or heavy

Being struck by materials or being caught in pinch points

Crushed by machines, falling materials or improperly stored materials

Incorrectly cutting ties or securing devices

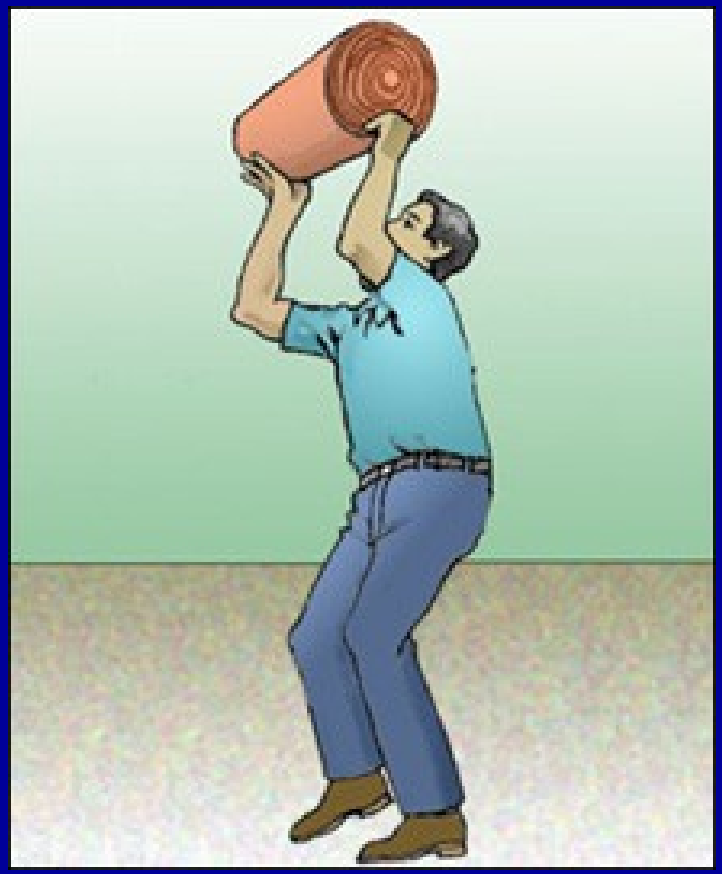
Manual Handling

Seek help:

- **When a load is too bulky to properly grasp or lift**
- **When you can’t see around or over the load**
- **When you can’t safely handle the load**

Attach handles to loads to reduce the chances of getting fingers smashed.

Safe Lifting



- **Break load into parts**
- **Get help with heavy or bulky items**
- **Lift with legs, keep back straight, do not twist**
- **Use handling aids - such as steps, trestles, shoulder pads, handles, and wheels**
- **Avoid lifting above shoulder level**

Safe Lifting Training

What should be taught:

- **How to lift safely**
- **How to avoid unnecessary physical stress and strain**
- **What you can comfortably handle without undue strain**
- **Proper use of equipment**
- **Recognizing potential hazards and how to prevent / correct them**

Personal Protective Equipment

For loads with sharp or rough edges, wear gloves or other hand and forearm protection

When loads are heavy or bulky, wear steel-toed safety shoes to prevent foot injuries if the load is dropped

Materials Handling Equipment

Employees must be trained in the proper use and limitations of the equipment they operate

This includes knowing how to effectively use equipment such as forklifts, cranes, and slings

Forklifts

Center the load on the forks and as close to the mast as possible to minimize the potential for the truck tipping or load falling

Overloading a lift truck makes it hard to control and could make it tip over

Place the load at the lowest position for traveling

Don’t place extra weight on the rear of a counterbalanced forklift to allow an overload

Operating a Forklift Safely

Keep arms and legs inside the truck

Handle only stable loads

Keep speed low - you may have to stop

Be careful when making sharp turns with a raised load

If a load blocks your view, travel in reverse

No riders, unless there's an approved seat

Don't drive with forks raised

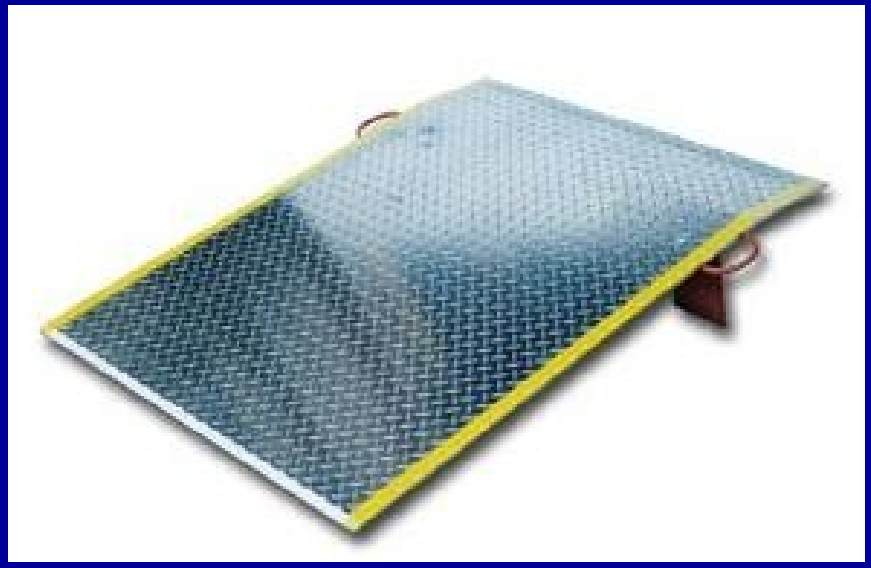
Wear safety belts or other restraint devices

Powered Industrial Truck Training

- Truck-related topics
- Workplace-related topics
- Standard requirements
- Trainees must be supervised by a competent person and not endanger others
- Formal instruction
- Practical training
- Evaluation of performance

Dock Boards (Bridge plates)

Dock boards must have handholds, or other effective means for safe handling.



Earthmoving Equipment

Scrapers, loaders, crawler or wheel tractors, bulldozers, off-highway trucks, graders, tractors

Provide seat belts

Equipment with an obstructed rear view can't be used in reverse unless the equipment has a signal alarm

Cranes

Check the load chart in the cab

Frequently inspect

Never lift people

Check overhead power lines

Ensure area of travel is clear

Rigging Equipment Slings

Types of slings covered are those made from alloy steel chain, wire rope, metal mesh, natural or synthetic fiber rope, and synthetic web.

Chain

Wire rope

Metal mesh

Synthetic

Sling Inspection

Inspect slings:

- **Each day before use**
- **Where service conditions warrant**

Remove them from service if damaged or defective

Remove From Service

Immediately remove damaged or defective slings from service

Alloy Steel Chains

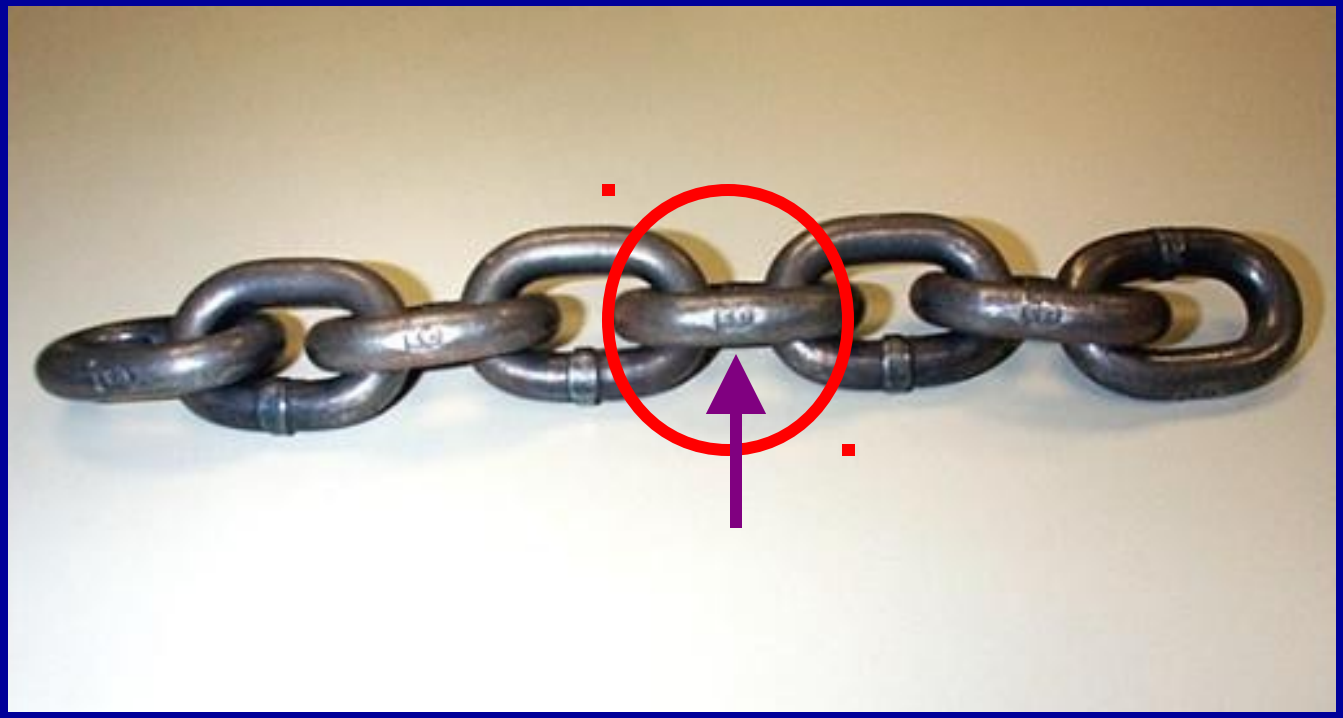
Adapts to shape of the load

Can damage by sudden shocks

Best choice for hoisting very hot materials

Must have an affixed tag stating size, grade, rated capacity, and sling manufacturer

Markings
Alloy Steel Chain



It must be marked with grade or manufacturer's mark

Alloy Steel Chain Attachments

Rated Capacity

Hooks, rings, oblong links, or other attachments, when used with alloy steel chains, must have a rated capacity at least equal to that of the chain

Unsuitable Alloy Steel Chain Attachments

Right

Wrong

Job or shop hooks and links, or makeshift fasteners, formed from bolts, rods, etc., or other such attachments, can’t be used

Chain Wear

When a chain shows excessive wear, or is cracked or pitted, remove it from service

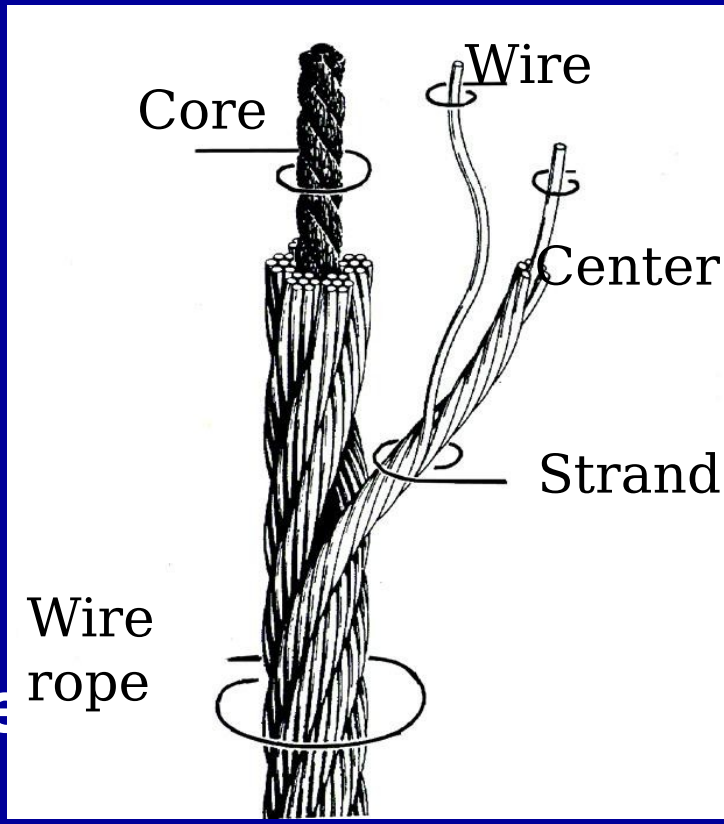
Non-alloy repair links can not be used

Wire Rope Slings

Used to hoist materials

Selection considerations:

- **strength**
- **ability to bend without cracking**
- **ability to withstand abrasive wear**
- **ability to withstand abuse**



Wire Rope Slings
Eye Splices

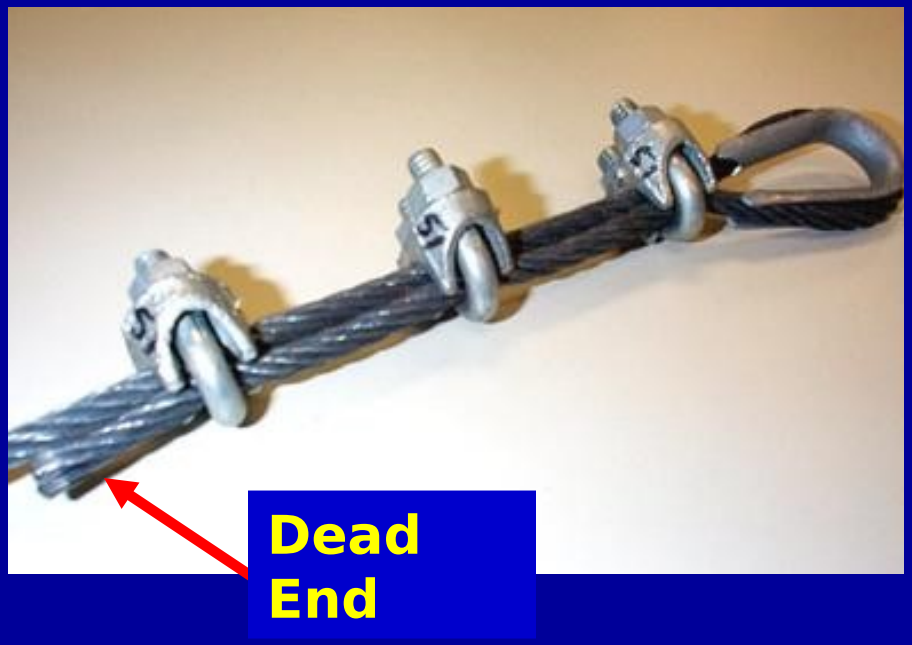
Eye splices made in any wire rope must have at least three full tucks

Protruding Ends

Cover or blunt protruding ends of strands

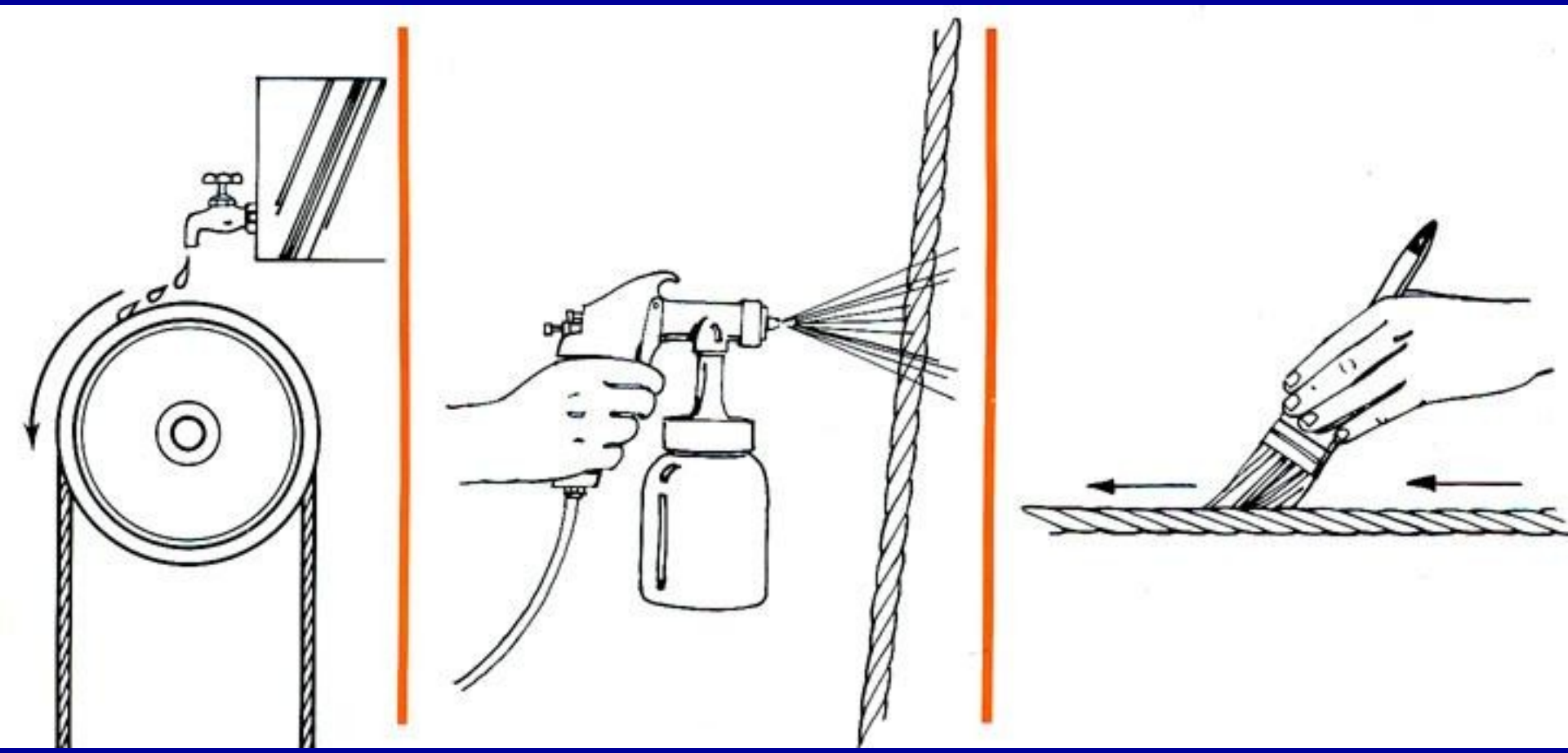
Wire Rope Clips

When using U-bolt wire rope clips to form eyes, ensure the "U" section is in contact with the dead end of the rope



This is the correct method

Lubrication



Regularly lubricate ropes and chains

Wire Rope Slings
Remove From Service

If these happen, remove the wire rope sling from s

Bird Caging

Kinking

Synthetic Web Sling
Markings

Mark or code to show:

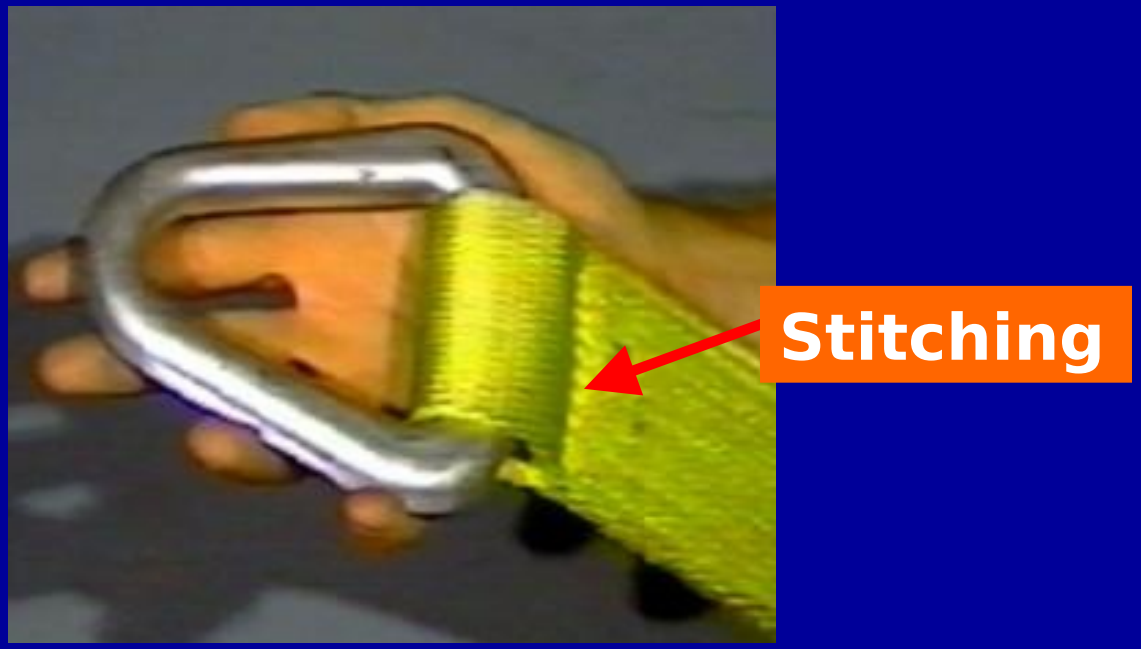
- **Name or trademark of manufacturer**
- **Rated capacities for the type of hitch**
- **Type of material**

Synthetic Web Slings
Fittings

Fittings must be:

- **At least as strong as that of the sling**
- **Free of sharp edges that could damage the webbing**

Synthetic Web Sling
Stitching

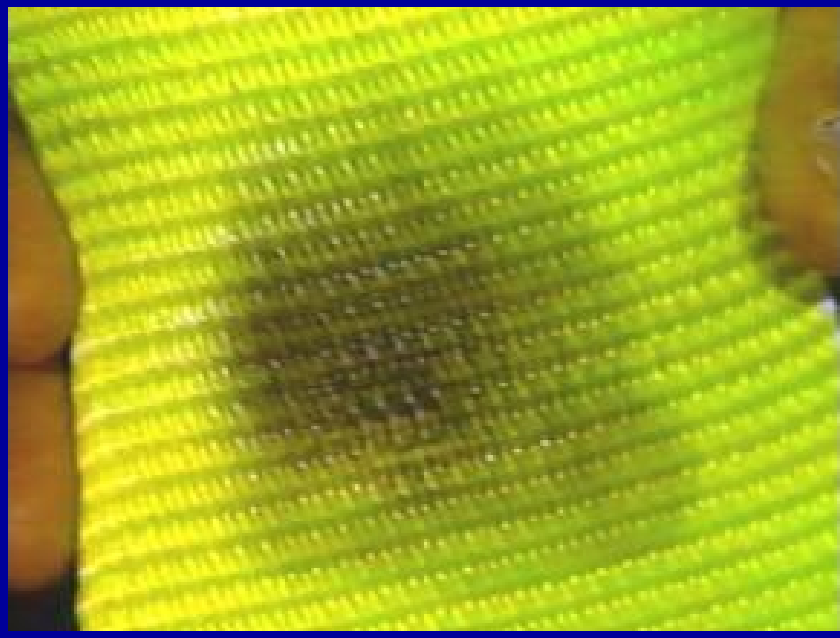


Stitching is the only method allowed to attach end fittings to webbing, or to form eyes

Synthetic Web Slings - Remove from Service

Remove from service if any of these are present:

- Acid or caustic burns
- Melting or charring of any part
- Snags, punctures, tears or cuts
- Broken or worn stitches
- Distortion of fittings



Heat Damage

Storing Materials

Secure materials stored in tiers by stacking, racking, blocking, or interlocking to prevent them from falling

Post safe load limits of floors

Keep aisles and passageways clear

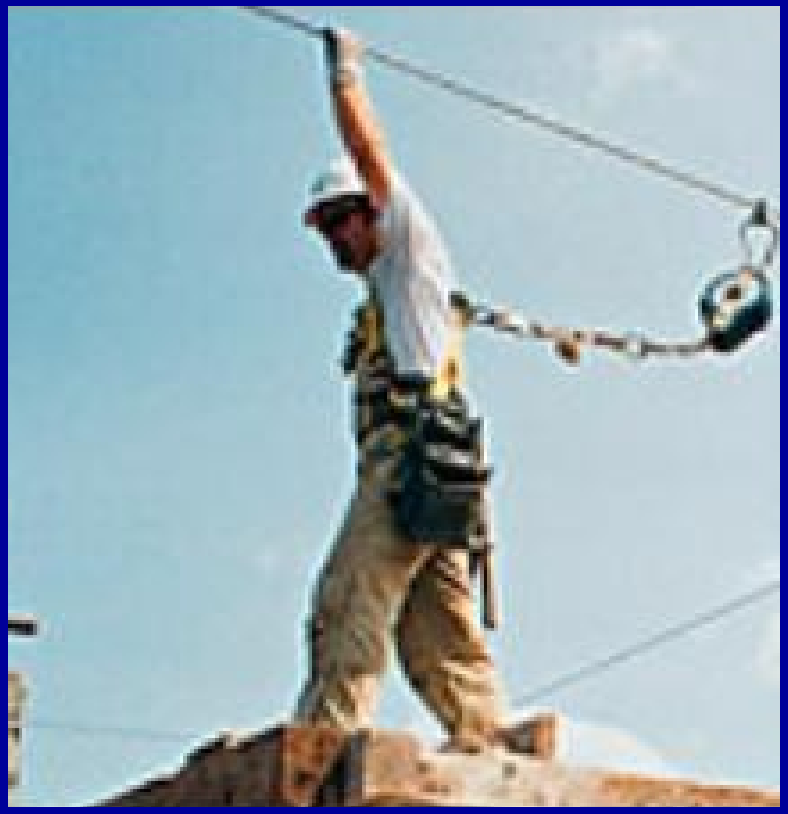
Storing Materials

Don’t store noncompatible materials together

In buildings under construction, don’t place stored materials within 6 feet of a hoistway or floor opening

Fall Protection

Employees who work on stored materials in silos, hoppers, or tanks, must be equipped with lifelines and harnesses



Brick Storage

Stack bricks in a manner that will keep them from falling

Do not stack them more than 7 feet high

Taper back a loose brick stack after it is 4 feet high

Lumber

Remove nails before stacking

Stack on sills

Stack lumber so that it is stable and self supporting

Housekeeping

Keep storage areas free from accumulated materials that cause tripping, fires, or explosions, or that may contribute to harboring rats and pests

Disposal of Waste Materials

Use an enclosed chute when you drop material more than 20 feet outside of a building

If you drop debris through holes in the floor without chutes, enclose the drop area with barricades

Disposal of Scrap and Flammable Materials

Remove all scrap lumber, waste material, and rubbish from the immediate work area as work progresses

Keep all solvent waste, oily rags, and flammable liquids in fire resistant covered containers until removed from worksite

Disposal of Demolition Materials

Removal of materials through floor openings

Openings must be less than 25 percent of the whole floor

Floors weakened or made unsafe by demolition must be shored so they can safely carry the demolition load

Summary

Manually handling materials

- When lifting objects, lift with your legs, keep your back straight, do not twist, and use handling aids

Using cranes, forklifts, and slings to move materials

- Watch for potential struck by and crushed by dangers
- For slings, check their load capacity, inspect them, and remove them from service when they display signs of stress or wear

Also -

- Keep work areas free from debris and materials
- Store materials safely to avoid struck by/crushed by hazards